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STATISTICAL AND ANALYTICAL SUPPORT OF ECOLOGICALLY ORIENTED DECISIONS MAKING IN THE TERRITORIAL CONTEXT

СТАТИСТИКО-АНАЛІТИЧНЕ ЗАБЕЗПЕЧЕННЯ ПРИЙНЯТТЯ ЕКОЛОГООРІЄНТОВАНИХ УПРАВЛІНСЬКИХ РІШЕНЬ У ПРОСТОРОВОМУ КОНТЕКСТІ

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Хижнякова Н.О. Статистико-аналітичне забезпечення прийняття екологоорієнтованих управлінських рішень у просторовому контексті. Науково-методична стаття.

Розкрито сутність екологоорієнтованих управлінських рішень та їх значення для зростання рівня екологічної безпеки і забезпечення сталого розвитку територій. Відображено просторові аспекти прийняття зазначених рішень та їх вплив на територіальний розвиток. Встановлено зміст статистико-аналітичного забезпечення прийняття екологоорієнтованих управлінських рішень та його роль на територіальному рівні. Побудовано концептуальну модель використання статистико-аналітичного забезпечення для прийняття екологоорієнтованих управлінських рішень у просторовому контексті. Сформовано систему статистичних показників, які пропонується використовувати для аналізу розвитку територій і територіальних громад. Сформульовано вимоги до якості статистичних показників зазначеної системи і статистико-аналітичного забезпечення екологоорієнтованих управлінських рішень в цілому.

Ключові слова: екологоорієнтовані управлінські рішення, територія, територіальна громада, аналіз, статистика, система статистичних показників, статистико-аналітичне забезпечення

Khyzhniakova N.O. Statistical and analytical support of ecologically oriented decisions making in the territorial context. Scientific and methodical article.

The meaning of eco-oriented decisions and their importance for the ecological security level increase and for the territorial sustainable development support are discovered. Spatial aspects of eco-oriented decisions making and their influence on the territorial development are reflected. The essence of statistical and analytical support of eco-oriented decisions making and its role on the territorial level are determined. The conceptual model for eco-oriented decisions making statistical and analytical support use in spatial context is constructed. The statistical index system offer to use for the territorial development analysis is formed. The quality requirements for statistical index system and for eco-oriented decisions making statistical and analytical support at whole are formulated.

Keywords: ecologically oriented decisions, territory, territorial community, analysis, statistics, statistical index system, statistical and analytical support

The ecological and economic problems intensification needs to make and realize effective ecologically oriented decisions today. The actuality of this problem investigation in spatial (territorial) context is caused by the administrative reform, decentralization, territorial communities' formation and the public management development. Ecologically oriented decisions making requires the territorial development analysis. In their turn it requires statistical and analytical support for their decisions ground.

Analysis of recent researches and publications

The territory development analysis methodology uses the national regional economics results, namely, the works of Z.S. Varnalii, S.A. Hensirik, M.I. Dolishnii, A.O. Yepifanov, V.S. Kravtsiv, I.R. Mykhasiuk, Ya.B. Oliinyk, V.O. Popovkin, D.M. Stechenko and other scientists.

The problems of sustainable development and its regional criteria are investigated by I.O. Aleksandrov, I.M. Bystriakov, B.V. Burkynskiy, T.P. Halushkina, O.O. Veklych, Z.V. Herasymchuk, B.M. Danylyshyn, S.I. Dorohuntsov, S.M. Illiashenko, L.H. Melnyk, V.S. Mishchenko, N.V. Pavlikha, M.A. Khvesyuk and others. The indicator systems allow to evaluate the correspondence of territory development to sustainable development requirements are elaborated by international organizations, first of all, by the United Nations Organization (Indicators of Sustainable Development: Guidelines and Methodologies, 2001 [1]; Global indicator framework for the Sustainable Development Goals and targets of the 2030 Agenda for Sustainable Development, 2017 [2]).

The works of O. Berdanova, V. Vakulenko, G. Vasylychenko, I. Parasiuk, N. Yeremenko have been published in recent years. They have been prepared with support of Ukrainian City Association and of international projects such as EuropeAid/132810/C/SER/UA [3], DESPRO [4], USAID [5] and others. They view methodological

aspects of territorial community development planning on the base of foreign experience. Besides that, V. Klosovski and Ya. Varda work [6] generalized the Polish experience in local development strategy formation.

Also, methodic recommendations to form and realize the prognosis and plan documents of social and economic development of the united territorial community were confirmed by the Order of Ministry of Regional Development, Building and Municipal Economy of Ukraine in March 2016 [7].

The aim of this article is to research the essence of statistical and analytical support of ecologically oriented decisions making on the territorial communities level.

So, the tasks of this investigation are the next:

- to discover the essence of ecologically oriented decisions and spatial aspects of their making;
- to determine the essence of statistical and analytical support of ecologically oriented decisions making;
- to define the role and the place of statistical and analytical support of ecologically oriented decisions making on the territorial level;
- to form the statistical index system, offer to use for the territorial development analysis;
- to formulate the quality requirements for statistical and analytical support of ecologically oriented decisions making.

The main part

The results of this investigation are the next. The adjective "ecologically oriented" (or short variant "eco-oriented") is widely used both in scientific publications and in ecological legislation. So, the next combinations of words are used: eco-oriented ("green") economics, eco-oriented decisions (in scientific works by B.V. Burkynskyi, T.P. Halushkina [8]), eco-oriented management (in works by N.I. Khumarova [9]), ecologically oriented investments (in works by N.M. Andrieieva, S.K. Kharichkov [10]) and others.

Specific definition of adjective "ecologically oriented" is absent in scientific publications, but from the context it can be comprehend as "giving attention to ecological aspects and to ecological criterions". So, the balanced nature use needs to make and realize economically rational and ecologically caused decisions [11, p.18].

Thus, ecologically oriented decisions can be defined as specific actions necessary to solve or to minimize available ecological and economic problems formed in the process of humanity and nature interaction [12, p.183].

Ecologically oriented decisions making allows exit from reserved cycle, when economic activities volumes, nature resources use and negative influence of them on the nature have constant growth, and go to ecological stabilization and improvement, to the ecological security level increase and to the territorial sustainable development support (figure 1).

The ecologically oriented decisions making spatial aspects use in their classification. So, according to the level of making can be given off the next types of ecologically oriented decisions: international (global)

level decisions; national level decisions; regional level decisions; local (municipal) level decisions; economic subject level decisions.

International (global) ecologically oriented decisions are making by specialized international organizations. They are, first of all, United Nations Organization structures: United Nations Environmental Program (UNEP); Sustainable Development Commission, Nature Resources Committee (in structure of United Nations Economic and Social Council); United Nations Conference of Trade and Development (UNCTAD); Global Ecological Fund; United Nations Food and Agricultural Organization (FAO) and others.

International ecologically oriented decisions also are making during the international environmental conferences and summits, from United Nations International Environmental Conference in Rio-de-Janeiro in 1992 to United Nations Climate Conference in Glasgow in 2021.

International ecologically oriented decisions are making by collegial method and, as a rule, have strategic character.

The national level ecologically oriented decisions are making by legislative (Parliament of Ukraine) and executive government bodies (Cabinet of Ministries of Ukraine, President of Ukraine, Ministry of Environment and Nature Resources Protection, other ministries, committees, services and agencies).

The regional level ecologically oriented decisions are making by the government bodies and the municipal bodies in the regions.

The local (municipal) level ecologically oriented decisions are making by the government bodies in districts and by the municipal bodies in districts, cities, towns, villages, city districts and also in territorial communities.

The economic subject level ecologically oriented decisions are making by the different economic subjects – the juridical and the physical persons. To support the ecologically oriented decisions effectiveness in this case it is necessary to form ecological policy directing on the ecologically oriented decisions making by the economic subjects.

The ecologically oriented decisions classification according to their environmental influence territorial distribution is also offered by the author to reflect their spatial aspects. It is offered to give off the next types of ecologically oriented decisions:

- decisions about the influence zone by the separate economic object, object group or event;
- local (municipal) character decisions – ecological effects of decisions include territory or part of territory of village, town, city, district or a few districts;
- regional character decisions – their decisions influence spreads on the territory of region or a few regions;
- national inclusion decisions – decisions influence include the whole territory of the state;
- trans border importance decisions – their decisions influence spreads on the territory of two or more states. These ecologically oriented decisions are

- frequent in connection with the air and water native movement. Ecological problems solving is present in most of the modern programs of trans border cooperation;
- ecosystem inclusion decisions – suppose influence on the separate ecosystem; their borders can be different of the district, region or state borders;

— international (global) importance decisions – decisions influence spreads on the territories of states ratified them.

The ecologically oriented decisions need statistical and analytical support for their ground.

The conceptual model for ecologically oriented decisions making statistical and analytical support use in spatial context is represent on figure 2.

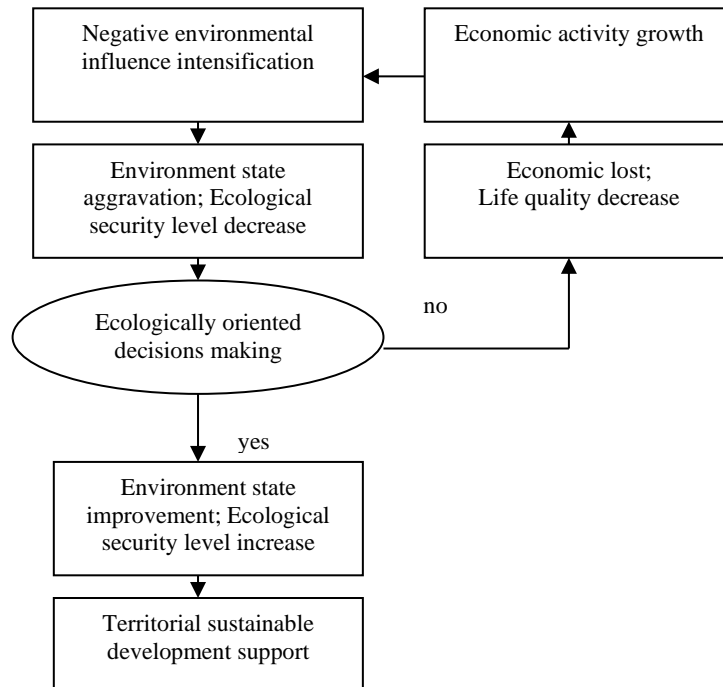


Figure 1. Ecologically oriented decisions making importance for territorial sustainable development support

Source: author's own development

As we can see, the statistical support is the ground for ecologically oriented decisions making and is doing before it. So, the statistical support is suggested to consider the statistical data collection, renovation, preservation and access organization, statistical index system formation and also statistical index calculation methodology formation.

The analytical support, in its turn, includes the statistical index calculation, analytical conclusion and offers formation, criterion for decision selection and decision influence evaluation on the territorial level.

The main steps of ecologically oriented decisions making process in territorial context are reflected further on the scheme (figure 2).

Analysis of the state of social-ecological-economic development of the territory and the territorial community is the most important for strategic development directions selection and first of all needs the statistical and analytical support.

Thus, the statistical index system offers to use for the territorial development analysis is formed in the article. The statistical indexes reflect the main parts of the territorial development: the social, the economic and the ecological development (table 1). At the same time the indexes divide into absolute and relative. The relative indexes have the grate analytical value. They

characterize the quality level of territorial development and allow compare different objects and territories.

Further is the territory selection for development of nature protection improvement and economic activity improvement with nature protection requirements account. That means regions selection and districts or territorial communities' selection in each of region for the same purpose.

The ecologically oriented decisions projects elaboration supposes selection from the next variants:

- selection the places for new nature protect objects or other objects includes project elaboration for object construction and territory comfort ability with positive ecological effects or minimization of negative influence of project economic activity on the environment;
- selection the available objects for negative influence minimization, for example, elaboration of projects for environment protects objects extending, projects for extending, reconstruction, profile change of different objects with nature protection requirements account, projects for threatening objects liquidation with nature protection requirements account;
- selection the territories for their use method change supposes elaboration the projects for territory sanitation.

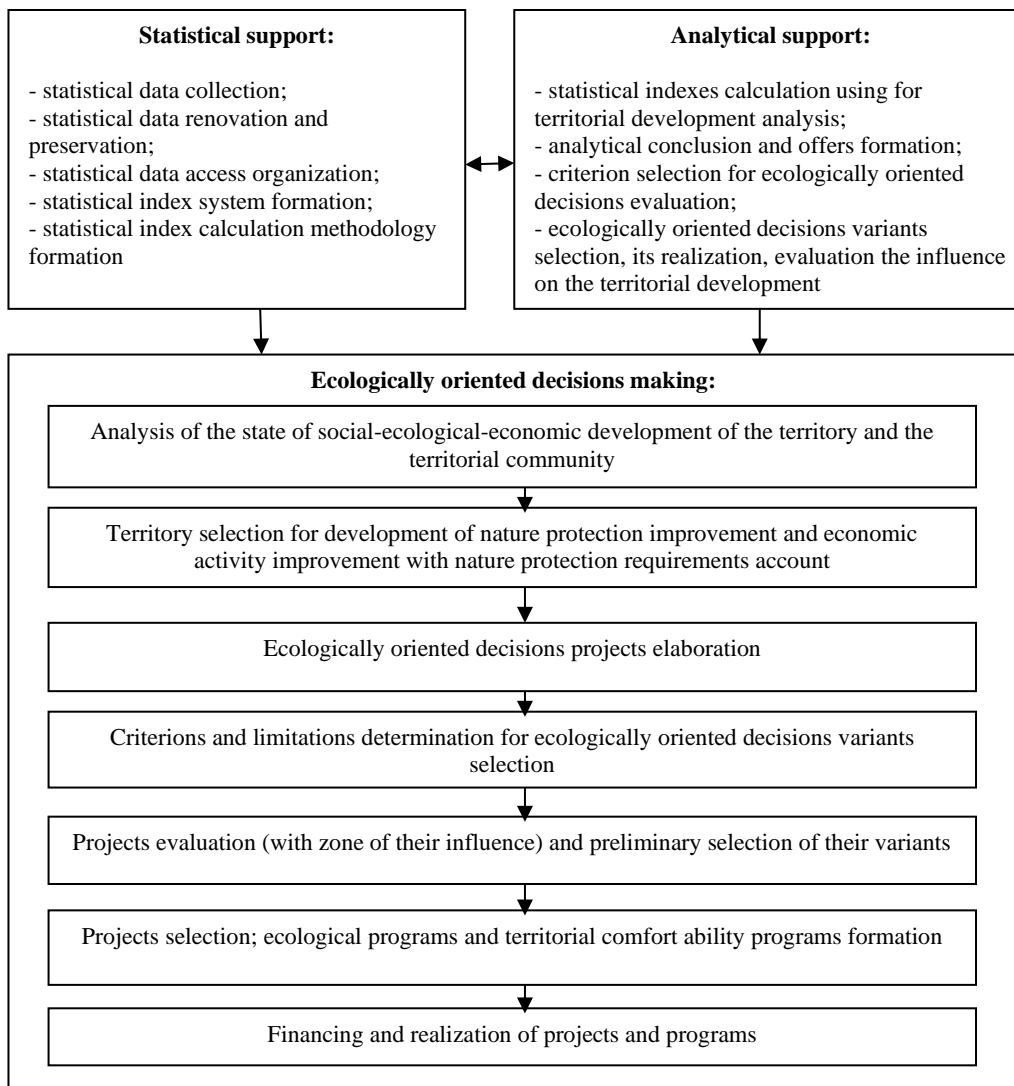


Figure 2. Conceptual model for ecologically oriented decisions making statistical and analytical support use in spatial context

Source: author's own development

The criteria and limitations determination for ecologically oriented decisions variants selection is the serious methodological problem.

The ecologically oriented decisions making must evaluate the different ecological effects.

It's very difficult to do full and correct quantitative

and cost evaluation of this effects.

Ecologically oriented decisions must be direct to ecological effects maximization. With minimal costs or maximal economic effects that is the many criterions problem is created.

Table 1. Statistical index system offers to use for the territorial development analysis

Territorial development parts	Absolute statistical indexes	Relative statistical indexes
1	2	3
Social development	Population quantity	Age, busyness, residence place population structure
	Busy population quantity	
	Able to work population quantity	Demographic loading on able to work population
	Urban and rural population quantity	Nature increase (decrease) of population
	Population income	Urbanization level
	Medical, cultural and educational institutions quantity	Migration level
	Budget cost on medicine, culture and education financing	
Population income structure and level		
		Medical, cultural and educational security level

Continuation of Table 1.

1	2	3
Economic development	Territorial community budget income	Income and cost budget structure
	Territorial community budget cost	
	Budget deficit (profit)	Tax level
	Enterprise quantity, including small and middle business	Deficit (profit) level
		Business activity level
	Regional development projects quantity	Finance volume on one project
	Regional development projects financing volume	Trade area on one inhabitant
	Investment volume	Road stretch on one inhabitant
	Products and services volume	
	Road stretch, including constructed and repaired	Importance, type, condition road structure
Ecological development (environment and nature resources condition)	Land area, including agricultural lands	Land structure
		Agricultural development level of lands
	Organic and mineral fertilizer use volume	Fertilizers use level
	Water supply and canalization volume	Organic agriculture development level
	Second water supply volume	Second water use level
	Water and air pollution volume	Water and air pollution level
	Waste volume	Waste utilization level
	Renewal energy source use volume	Renewal energy source use level
	Forest area	Forest area level
Nature reserve objects quantity and area	Nature reserve objects area level	

Source: compiled by author on materials [1-7].

This task can have one criterion if to formulate it as the task for maximal special ecological effect achievement with minimal value of other ecological effects limitation or maximal value of costs (or minimal value of profit) limitation.

And, on the contrary, minimal costs (or maximal profit) uses as a criterion and minimal values of ecological effects use as limitations.

For one criterion decision without limitations the integral criterion of maximal ecological and economic effect or efficiency must be use.

It is desirable to add the projects evaluation (with zone of their influence) and preliminary selection of their variants with experiments that is the pilot projects realization.

After preliminary selection the totality of select projects can be united in national, regional and municipal programs, including ecological programs.

The conceptual model for ecologically oriented decisions making statistical and analytical support use in spatial context, given on figure 2, includes decisions making on the national, regional and municipal level. As for the economic object level decisions, they must evaluate the territorial aspect only by the wide territorial spread.

Thus, ecologically oriented decisions making and realization requires the high value of statistical and analytical support quality. The quality requirements for statistical and analytical support of ecologically oriented decisions making are the next:

- high spread of statistical indexes system of the main parts of the territorial development;
- high analytical value of statistical indexes and their system at whole;
- reliability of information base;
- statistical data renovation;

— preservation safety and comfortable access organization.

Conclusion

Thus, ecologically oriented decisions can be defined as specific actions necessary to solve or to minimize available ecological and economic problems formed in the process of humanity and nature interaction. Ecologically oriented decisions making allows exit from reserved cycle, when economic activities volumes, nature resources use and negative influence of them on the nature have constant growth, and go to ecological stabilization and improvement, to the ecological security level increase and to the territorial sustainable development support.

The statistical support is the ground for ecologically oriented decisions making and is doing before it. So, the statistical support is suggested to consider the statistical data collection, renovation, preservation and access organization, statistical index system formation and also statistical index calculation methodology formation. The analytical support, in its turn, includes the statistical index calculation, analytical conclusion and offers formation, criterion for decision selection and decision influence evaluation on the territorial level.

The essence and the role of statistical and analytical support of ecologically oriented decisions making are reflected in the conceptual model of their decision making on the territorial level.

The statistical index system offers to use for the territorial development analysis is formed in the article. The statistical indexes reflect the main parts of the territorial development: the social, the economic and the ecological development. At the same time the indexes divide into absolute and relative. The relative indexes have the grate analytical value. They

characterize the quality level of territorial development and allow compare different objects and territories.

The ecologically oriented decisions making and realization requires the high value of statistical and analytical support quality. The quality requirements for statistical and analytical support of ecologically oriented decisions making are the next: high spread of statistical indexes system of the main parts of the territorial development; high analytical value of statistical indexes and their system at whole; reliability

of information base; statistical data renovation; preservation safety and comfortable access organization.

The quality requirements for statistical and analytical support of ecologically oriented decisions making supply allows get the high level of territorial development analysis and, thus, correct selection of strategic priorities and of separate development programs and projects.

Abstract

The processes of decentralization and the public management development and also available ecological problems on the territorial level require ecologically oriented decisions making. In their turn it requires statistical and analytical support for their decisions ground.

The purpose of this article is to research the actual view on the ecologically oriented decisions, on their importance for the ecological security level increase and for the territorial sustainable development support, to define essence of statistical and analytical support of eco-oriented decisions making and its role on the territorial level, to construct the conceptual model of its using in spatial context, and, at last, to form the statistical index system and to formulate the quality requirements for it. The results of this investigation are the next. First of all, ecologically oriented decisions are the operation totality necessary to solve available ecological and economic problems. They have the paramount importance for the ecological security level increase and for the territorial sustainable development support. The ecologically oriented decisions need statistical and analytical support for their ground. The statistical support is suggested to consider the statistical data collection, renovation, preservation and access organization and also statistical index system formation. The analytical support, in its turn, includes the statistical index calculation, conclusion formation, criterion for decision selection and decision influence evaluation on the territorial level. The essence and the role of statistical and analytical support of ecologically oriented decisions making are reflected in the conceptual model of their decision making on the territorial level. The statistical index system offer to use for the territorial development analysis is formed in the article. The statistical indexes reflect the main parts of the territorial development: the social, the economic and the ecological development. At the same time the indexes divide into absolute and relative. The relative indexes have the grate analytical value. They characterize the quality level of territorial development and allow compare different objects and territories.

And, at last, the quality requirements for statistical and analytical support of ecologically oriented decisions making are formulated in the article. They contain the high analytical value of statistical indexes and their system at whole, reliability, statistical data renovation, preservation safety and comfortable access organization.

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